

Claims

What is claimed is:

- 1 ~~1. A vaccine useful in preventing and treating diseases caused by a pathogen capable of~~
2 ~~infecting, or avoiding destruction by, macrophages, said vaccine comprising at least one vector~~
3 ~~that comprises at least one nucleotide sequence encoding at least one antigen derived from said~~
4 ~~pathogen, and wherein said antigen is capable of generating an immune response in a recipient~~
5 ~~thereof.~~
- 1 2. The vaccine of claim 1, wherein said pathogen is *P. acnes*, *L. monocytogenes*, *S.*
2 *typhimurium*, *N. gonorrhoea*, *M. avium*, *M. tuberculosis*, *M. leprae*, *B. abortus*, *C. albicans*; *L.*
3 *major*, or combinations thereof.
- 1 3. The vaccine of claim 2, wherein said pathogen is *P. acnes*.
- 1 4. The vaccine of claim 1, wherein said vector comprises naked DNA, a recombinant viral
2 vector, or a combination of both.
- 1 5. The vaccine of claim 4, wherein said recombinant viral vector is selected from the group
2 consisting of adenovirus, adeno-associated virus, herpes virus, vaccinia and RNA viruses.
- 1 6. The vaccine of claim 5, wherein said recombinant viral vector is an adenovirus.
- 1 7. The vaccine of claim 1, wherein said vector further comprises a nucleotide sequence encoding
2 an adjuvant.
- 1 8. The vaccine of claim 7, wherein said adjuvant is a cytokine.
- 1 9. The vaccine of claim 8, wherein said cytokine is IL-2, IL-12, or both.

1 10. The vaccine of claim 1, wherein said antigen is a lipase gene or fragments thereof, a
2 hyaluronidase gene or fragments thereof, a phosphatase gene or fragments thereof, or
3 combinations of the foregoing.

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1 ~~11.~~ A method of treating or preventing a disease caused by a pathogen capable of infecting, or
2 avoiding destruction by, macrophages, said method comprising obtaining a vaccine comprising
3 at least one vector that comprises at least one nucleotide sequence encoding at least one antigen
4 derived from said pathogen; and administering said vaccine to a recipient in need thereof.

1 12. The method of claim 11, wherein said administering comprises routes of administration
2 comprising oral, intravenous, intramuscular, transcutaneous, subcutaneous, aerosol, ocular,
3 rectal, intraperitoneal, intrathecal, or combinations thereof.

1 13. The method of claim 12, wherein administering comprises transcutaneous administration.

1 14. The method of claim 13, wherein said transcutaneous administration comprises applying
2 said at least one vector to a patch, and adhering said patch to skin of said recipient.

1 15. The method of claim 11, wherein said pathogen is *P. acnes*, *L. monocytogenes*, *S.*
2 *typhimurium*, *N. gonorrhoea*, *M. avium*, *M. tuberculosis*, *M. leprae*, *B. abortus*, *C. albicans*; *L.*
3 *major*, or combinations thereof.

1 16. The method of claim 15, wherein said pathogen is *P. acnes*.

1 17. The method of claim 11, wherein said at least one vector comprises naked DNA, a
2 recombinant viral vector, or a combination of both.

1 18. The method of claim 17, wherein said recombinant viral vector is an adenovirus.

1 ~~19.~~ A kit comprising a container and one or more patches, wherein said patches have disposed
2 thereon at least one vector comprising a nucleotide sequence encoding an antigen derived from a
3 pathogen, said pathogen being capable of infecting, or avoiding destruction by, macrophages.

1 ~~20.~~ An article of manufacture comprising a vaccine solution disposed within a tube, vial, bottle,
2 can, or syringe, wherein said vaccine solution comprises a viral vector comprising a nucleotide
3 sequence encoding an antigen derived from a pathogen, said pathogen being capable of infecting,
4 or avoiding destruction by, macrophages.

1 21. The vaccine of claim 1, wherein said vaccine is in the form of an aqueous solution.

1 22. The vaccine of claim 1, wherein said vaccine further comprises a nucleotide sequence
2 encoding a co-stimulatory molecule.

1 23. The vaccine of claim 22, wherein said co-stimulatory molecule comprises a B7 protein, a
2 CD40 protein or both.

1 ~~24.~~ A method of cosmetically improving the appearance of a person's skin who is suffering
2 from acnes vulgaris, said method comprising the steps of obtaining a composition comprising a
3 mixture of at least one vector that comprises at least one nucleotide sequence encoding at least
4 one antigen derived from said P. acnes, and a cosmetic agent; and administering said
5 composition to said person.